PRIZM™

Video 3 Input/Output Boards

Users' Manual

And

Troubleshooting Guide

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Rev. E

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1 Video 3 Board

Part Number -200460-xxx (Input) -200470-xxx (Output)

The Video 3 board supports four 10-bit digitized video channels. Unlike the earlier Video 1 and Video 2 Video boards, there are NO data channels physically on this board and thus there are no ribbon cable connectors. Also, unlike the Video 1 and Video 2 boards, the Video 3 board does not require a video sync in the signal to operate, thus it can be configured for passing analog data. There are two versions of the Video 3 boards, in input and an output board, and they are used in conjunction with each other at opposite ends of the link.

1.1 Video 3 Board Revision History:

The Video 3 Input board has gone through the following printed circuit board (PCB) and Assembly revisions:

<u>PCB Revision A/Assembly Revision A</u> Original design.   Not currently in production.

<u>PCB Revision B/Assembly Revision A-C</u> Corrected PCB layout and component values errors.

<u>PCB Revision B/Assembly Revision D</u> Modified resistor values to improve video clamp circuit.

<u>PCB Revision B/Assembly Revision E</u> Modified resistor values to improve video clamp circuit. Currently in full production.

The Video 3 Output board has gone through the following printed circuit board (PCB) and Assembly revisions:

<u>PCB Revision A/Assembly Revision A</u> Original design.   Not currently in production.

<u>PCB Revision B/Assembly Revision A-B</u>   Corrected PCB layout and component value errors.

<u>PCB Revision B/Assembly Revision C</u>   Currently in production.

1.2 Video 3 Board Dash (-) Number Definitions:

The Video 3 board has a Dash Number appended to the part number. This Dash Number identifies the specific board configurations:

Video 3 Input boards:
-001 standard configuration with SMB video connectors
-002 not released
-003 RGB version, 3 video channels only
-004 4 channel side-scan sonar version
-005 multimode, single board video 3 with 4 x video channels
-006 special video inputs on all 4 channels
-007 analog/4 channel sonar
-008 single board video, 4 x video channels
-009 custom 4 x video channels with video transient suppression
-010 custom 8 MHZ video bandwidth on all channels
-011 4 x analog channels
-012 1 x pseudo-video channel on a single backplane bit
-013 2 x video channels
-014 3 x video channels
-015 Ch1 and 2 video, Ch3 and 4 analog
-016 1 x RGB (3 video channels), 1 x Composite (1 video channel)
-017 1 x video channel + 3 x analog channels
-018 4 x hydrophone channels on single backplane bit
-019 single board video, 4 x video channels with video transient suppression

Video 3 Output boards:
-001 standard configuration with SMB video connectors
-002 not released
-003 RGB version, 3 video channels only
-004 4 channel side-scan sonar version
-005 multimode, single board video 3 with 4 x video channels
-006 analog/4 channel sonar
-007 custom 8 MHZ video bandwidth on all channels
-011 4 x analog channels
-012 1 x pseudo-video channel on single backplane bit
-013 2 x video channels
-014 3 x video channels
-015 Ch1 and 2 Video, Ch3 and 4 Analog
-016 1 x RGB (3 video channels), 1 x Composite (1 video channel)
-017 1 x video channel + 3 x analog channels
-018 4 x hydrophone channels on single backplane bit

1.3 Video 3 Board Operation:

The Video 3 Input board accepts four video input signals from cameras via SMB electrical connectors. The four video signals are digitized by 10-bit analog-to-digital (ADC) converters. The older Video 1 and 2 boards used 8-bit ADCs so the video resolution has been improved by a factor of four. The corresponding Video 3 Output board at the other end of the link accepts the four digitized video signals and converts them back to analog signals via digital-to-analog (DAC) converters.

The video channels are unidirectional and the direction depends on whether the board is a Video 3 Input or Output. Video 3 boards work in pairs of one input and one output board. When using multiple pairs, proper board pair addressing is critical. Surface unit Video board #1 must be configured to work with the sub-sea unit's Video board #1 and surface unit Video board #2 must be configured to work with the sub-sea unit's Video board #2.

This is accomplished by setting the 4-position DIP switch (SW1) to "BD1" for board #1 or "BD2" for board #2 as appropriate. There are two other positions, "BD3" and "BD4", but these are not used and reserved for future applications. The board number ("Board 1" or "Board 2") is imprinted on the Video 3 board extractor handle ID tag and the ID tag should be changed to reflect the current board identification number, if board ID addresses are changed. On Video 3 Input boards, a jumper shunt must also be placed on JP30 at "TD19" if the board is configured for "Board 1" or on JP30 at "TD18" if configured for "Board 2".

1.3.1 Video 3 Board Indicator and Controls:

There are two LED power indicators on the front panel of the Video 3 board labeled +5 and -5. (+5 volts DC and -5 volts DC) The green +5 and -5 LEDs are lit whenever +5VDC power and -5VDC power are available to the board.

Each video channel on both the Video 3 Input and the Video 3 Output board has a yellow LED (LED2 through LED5) that lights to indicate that a video (or analog signal of sufficient amplitude) signal is present on that channel.

Video 3 Input and Output boards have four trim pots (one for each video channel) that are accessible through the front panel adjustment holes (labeled VR1 through VR4) and are used to adjust gain.

1.3.2 Video 3 Board Specifications:

Number of Channels: 4 video
Video Sample Rate: 12.5 Msps typically
Video Bandwidth: 6 MHz typically
Video Quantizing: 10-bits or 1024 levels

1.3.3 Video 3 Board Dimensions:

VME 3-U format. 100 mm wide x 160 mm long x 20 mm thick
                 (3.937 in x 6.299 in x 0.80 in)

VME 3-U PCB and faceplate in rack: 20 mm wide x 128 mm high (0.8 in x 5.05 in)

1.3.4 Video 3 Board Power Requirements:

+5 Volts at 1.0 Amps (5.0 Watts)
-5 Volts at 0.1 Amps (0.5 Watts)

1.4 Video 3 Board Adjustment and Troubleshooting

In normal operation the following LED status should be observed:

> +5 volts power LED - Lit green
> -5 volts power LED - Lit green
> Four channel activity LEDs - Lit yellow when camera is activated on that channel

Once a good optical link is established between the vehicle and surface units, a video test pattern or camera can be used to generate a test signal for display on a video monitor. Verify that all video channels are active. In this example there are eight independent video channels, 4 on each Video 3 board. When the video input source is connected to one of the 4 channels on a video input board, a yellow LED will light on the corresponding channel of the Video output board.

NOTE: a fiber optic link must be made in BOTH DIRECTIONS for the multiplexer to work properly.

1.4.1 Board Level Testing:

If either section of the power LED is out:
- Check for +5VDC and -5V DC at the backplane connector.

If correct power is measured:
- Check LED and transistor circuit

If power is not found:
- Check power entry at backplane and test power supply (see power supply section of manual)

If one or more video channels are tearing or have low video level:
- Adjust the gain on Video 3 Input board to a 1 to 1 gain, utilizing trimpots VR1 - VR4. Access to these trimpots is through the front panel of the board, next to the yellow LEDs.
- Adjust the gain on Video 3 Output board to a 1 to 1 gain, utilizing trimpots VR1 - VR4. Access to these trimpots is through the front panel of the board, next to the yellow LEDs.

If one or more video channels are out:
- Verify that Video 3 Input board is installed on camera side of link (Usually ROV end) and that Video 3 Output board is installed in the monitor side of the link (usually the surface unit).

Note: Fiber link is bi-directional, so it does allow video in both directions. Down link video channels are sometimes used to carry sonar control signals to the ROV.)

- Verify that Video 3 board address dip switch is correctly set for BD1 or BD2 and that the surface and ROV ends of the link are set identically.

Note: On Video 3 Input boards only, a jumper shunt must also be placed on JP30 at "TD19" if the board is configured for "Board 1" or on JP30 at "TD18" if configured for "Board 2".

Note: "BD3" and "BD4" selections are not available

- Inspect camera, cables, monitor, ribbon, etc.

If no improvement is noted:
- Replace board with spare, starting at Video Input side first followed by the Output side.